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Poverty in Poland

1978-88

Branko Milanovic

As a result of Poland's economic crisis, which began in 1978, the proportion of Polish people living below the poverty line increased from 10 percent to almost 20 percent. Farm and mixed (farm/nonfarm) households weathered the crisis better than workers and pensioners — probably because farmers could vary their crops and workers in mixed households could choose between work in socialized industry or private agriculture.

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This paper — a joint product of the Socialist Economies Reform Unit, Country Economics Department and the Country Operations Division, Country Department IV, Europe, Middle East, and North Africa Regional Office — was written as a background paper for the 1990 *World Development Report* on poverty. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact the World Development Report office, room S13-060, extension 31393 (25 pages).

The economic crisis that began in Poland in 1978 significantly reduced the population's average incomes (about 20 percent by 1988) and increased the proportion of the population living below the poverty line by 10 percentage points. (It is significant that 3.1 million of the 7 million estimated poor in Poland are the "new poor.")

The composition of the poor has also changed. Before the crisis, most of the poor lived in rural areas; now 70 percent of them live in cities. This change occurred because of a sharp jump in poverty among workers in the socialized sector, whose real wages declined.

The most important direct cause of increased poverty in the second half of the 1980s was increased poverty in workers' households. The second most important cause was demographic: in shifting to retirement, some workers' households joined the ranks of the poor. The only group for which the incidence of poverty decreased was mixed households.

Until the end of the period studied (1988), no unemployment appeared. The wage bill was reduced by uniform cuts in real wages — so the wage and the overall distribution of income remained practically unchanged. The real income of pensioners' households decreased almost as much as that of workers' households.

Farm and mixed households weathered the crisis better than workers and pensioners. This was not so much because terms of trade between agriculture and industry improved, but because farmers and mixed households had more flexibility about economic decisions. Farmers could change the composition of their crops and mixed households could also vary their labor inputs between work in socialized industry and private agriculture.

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Poverty in Poland, 1978-88

by
Branko Milanovic

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POVERTY IN POLAND, 1978-88[1]

Branko Milanovic

1. Introduction

This paper considers the issue of poverty in Poland in the period 1978-88. The first year of the period represents a benchmark year. It is the year when Polish GDP peaked, and real incomes of the population were higher than at any time since. The decline in GDP continued until 1983. Since then the economy notched modest increases. By the end of the period (1988), GDP per capita was 1.5 percent below its pre-crisis level, while the average standard of living (as reflected in real per capita income of the population) was 20 percent lower. It is important to study how economic stagnation affected the poor. It is generally felt that poverty expanded significantly. The appearance of soup kitchens in main cities of Poland in 1989 provides a tangible evidence of the degree of pauperization. In order to avoid possible misunderstanding we must state explicitly what are the premises and sources on which our analysis is based.

First, the words "poverty" or "poor" should be understood only in their technical meaning. We classify as "poor" all people whose incomes are less than the social minimum calculated by the Institute of Labor and Social Affairs in Poland.[2] This is a purely conventional definition, since it is generally held that the social minimum is higher than what most people in Poland would regard as uncontestable poverty. It is also higher than a pure existential minimum (or some measure based on a minimal calorie intake). Yet the social minimum, as defined by the Institute,

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[1] The first draft of this paper, covering the period 1978-87, was written as a background paper for the World Bank *World Development Report 1990*. The author acknowledges comments made, at various stages of the paper, by Bela Balassa, Lyn Squire, Aleksandra Posarac, Irena Topinska and Michael Walton.

[2] We are dealing with incomes and not expenditures. Incomes, however, are corrected for consumption requirements, so that we classify as poor a household whose income *per consumption unit* is less than some minimum. Classified as poor are obviously all persons in this household.

allows only for a very minimal satisfaction of human needs. A more detailed description of the minimum is provided in Annex 1.

The social minimum represents that level which at a given time and in a given environment is deemed indispensable for decent living. This is the rationale for treating the minimum as the "poverty line". The poverty line must consequently be understood as relevant only in a specific context, limited both in space and time: the Poland of the 1980's. Since the line is constant in real terms, it allows us to chart relatively well how the extent and the composition of poverty changed during the last ten years.

The paper is not concerned with economic and sociological characteristics of the poor *per se*. It is also beyond the scope of the paper to study the route by which people fall into poverty, and how different specific subgroups (e.g. single mothers, school drop-outs, unskilled people in the countryside) are affected. This requires much more detailed micro analysis. The approach adopted here is more of a "broad-brush" kind. We use only published sources and:

(1) estimate the extent of poverty in the last ten years;

(2) study how composition and incidence of poverty in the four main social groups (workers', mixed, farmers', and pensioners' households) has changed and;

(3) propose some general, relatively simple and intuitive, explanations of the macro-economic factors that influence changes in poverty.

We are concerned only with the "head-count" or poverty incidence measure.[3] This is partly determined by the nature of the task ("How many people are (have become) poor?"), and is partly chosen for reasons of simplicity.

The structure of the paper reflects these objectives. Section 2 charts the evolution of poverty. In Section 3 we presents some "poverty accounting". This is an attempt to disentangle demographic and migrational effects from purely economic effects.[4] We shall be concerned with households who in

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[3] Terms "poverty coefficient" and "poverty incidence" are used interchangeably.

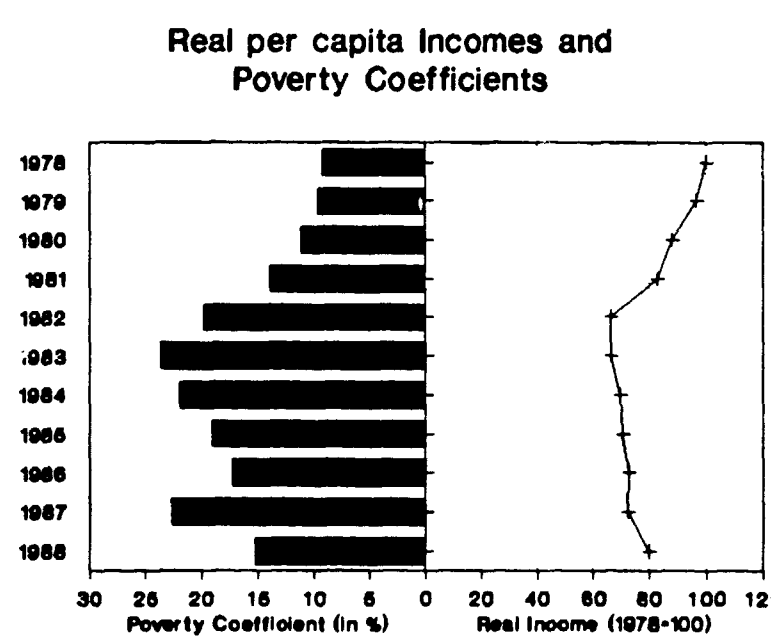
[4] For example, if population growth rates are higher in low income groups, then an increase in population, with everything

the last ten years have joined the ranks of the poor. These are "the new poor" and to find out who they are, is, for political and social reasons, particularly important. Section 4 presents some econometric evidence on poverty, viewing the percentage of the poor in a social group as determined by two variables: average income of the group and inequality of income distribution within the group.

2. Changes in Poverty, 1978-88

Total percentage of people classified as poor in 1987 and 1988 is almost twice as high as at the onset of the crisis in 1978. As mentioned before, Polish real GDP then reached its peak. Between 1979 and 1982 GDP per capita decreased by 24 percent. The decline was without precedent in post-war Europe. Starting from 1983 relatively slow recovery began with the result that in the last year of the period under study (1988) GDP per capita was only slightly below the 1978 level. Real income of the population as obtained from *Household Surveys* was 20 percent lower than in 1978 (see Figure 1). It is therefore not surprising to find that while the share of the poor in total population was u 10 percent in 1978-79, since 1982 it has been less than 17 perce..t only once.

Figure 1



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else the same, increases the percentage of the poor; or a transfer of popul'ion from "high-poverty" groups or areas to "low-poverty" groups o. ..ea reduces the overall poverty incidence.

The overall (country-wide) poverty coefficient is the outcome of two effects: different poverty coefficients for different social groups, and varying shares of social groups in the sample. These data are presented in Tables 1 and 2 Consider first the structure of the sample. If we compare only the end years of the period (1987-88 vs. 1978-79) we can see that the structure of population as between urban and rural households is practically unchanged. Rural population (mixed and farmers) accounts for

Table 1. Poverty Coefficients, 1978-88
(share of the poor in total group's population) a/

	Workers	Mixed	Farmers	Pensioners	Total
1978	6.4	9.5	14.9	20.8	9.2
1979	6.1	12.8	16.7	17.1	9.7
1980	7.8	10.6	17.2	23.7	11.1
1981	11.4	11.4	16.4	29.2	13.9
1982	17.3	15.8	20.9	35.7	19.8
1983	19.1	13.4	29.7	49.0	23.7
1984	19.0	12.9	25.1	39.3	21.9
1985	17.3	11.3	19.5	32.4	19.1
1986	17.0	9.4	19.2	25.4	17.3
1987	25.2	12.6	21.4	27.6	22.7
1988	14.8	8.0	14.4	25.9	15.2

a/ Coefficients are calculated in terms of total group's population (individuals in a group not households).

Table 2. The Structure of the Sample, 1978-88
(in percent of total sample)

	Workers	Mixed	Farmers	Pensioners	Total
1978	61.7	17.1	13.3	7.8	100
1979	61.2	16.1	13.9	8.9	100
1980	60.5	15.8	13.9	9.8	100
1981	60.3	15.5	14.0	10.2	100
1982	61.6	12.7	13.7	11.9	100
1983	61.4	13.8	10.9	14.0	100
1984	61.1	13.2	10.8	14.8	100
1985	60.5	13.0	10.9	15.6	100
1986	55.5	16.9	13.0	14.7	100
1987	52.5	18.4	14.7	14.7	100
1988	52.1	18.4	14.2	15.2	100

slightly over 30 percent of the sample, about 2-3 percentage points more than in the beginning of the period. The composition of the rural population is broadly unchanged as both the share of

farmers' and mixed households went up by about 1 percentage point. The situation among urban households is different. The importance of workers' households has decreased from more than 60 percent of the sample to about 52 percent; conversely, the share of pensioners has increased from 8-9 percent to 15 percent.[5]

The last fact, namely increasing share of pensioners, points to the first cause of increased poverty. Since pensioners' households consistently have the highest incidence of poverty, an increase in their share drives the overall poverty coefficient up. Poverty incidence *among* pensioners has increased from less than 20 percent (in the beginning of the period) to 25-26 percent. While in the beginning of the period pensioners contributed about 1.6 points to the overall poverty coefficient (this is the product of the group's poverty coefficient and its share in the sample; see notes to Table 3), this increased to 4 points. Pensioners thus alone account for 2.4 percentage point increase in the overall poverty coefficient.[6] This explains a quarter of the overall increase.

The second important cause of increased poverty has to do with workers' households. They display two essential characteristics: declining share in total population and rising poverty coefficient. The second feature is not unique to workers: poverty coefficients for all social groups except for mixed households increased. Workers households, however, were the most severely affected. Probability of living in a poor worker household has tripled: the poverty coefficient increased from little over six percent before the crisis to 25 percent in 1987 and 15 percent in 1988. Developments among workers' households thus account for 6.5 percentage point increase in the overall poverty coefficient: they explain more than two-thirds of the total increase. *Combined urban households (workers and*

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[5] Comparison between the end and the beginning of the period always refers to years 1987-88 and 1978-79. The average of two years is taken to even out sharp yearly fluctuations.

[6] The peak in terms of pensioners' contribution was reached in 1983, when extremely high poverty incidence (49 percent) and a high share (14 percent) combined to make pensioners' contribution to total poverty almost 7 percent.

pensioners) therefore explain 95 percent of the overall increase in poverty.

Table 3. Factors Explaining the Change in Poverty 1987-88 versus 1978-79

Contributions[a/]	Workers	Mixed	Farmers	Pensioners	Total
1978-79	3.87	1.85	2.15	1.58	9.45
1987-88	10.42	1.90	2.58	4.01	18.91
Change	+6.55	+0.05	+0.43	+2.42	+9.46
Relative contribution(%)[b/]	69.3	0.5	4.5	25.6	100
Poverty effect[c/]	+8.41	-0.14	+0.28	+0.65	9.21
Population eff.[d/]	-0.59	+0.20	+0.14	+1.25	1.01
Interaction term	-1.27	-0.02	+0.02	+0.52	-0.75
Total	*+6.55*	*+0.05*	*+0.43*	*+2.42*	*+9.46*

a/ The product of the group's share in total population and its poverty coefficient.

b/ Group's contribution to poverty divided by the overall change in the poverty coefficient.

c/ Calculated on the assumption that the group's share in total population is the same as in 1978-79, and that only its poverty coefficient has changed.

d/ Calculated on the assumption that the group's poverty coefficient is the same as in 1978-79, and that only its share in total population has changed.

The mechanism leading to the increased contribution to poverty has been different for workers' and for pensioners' households. For workers, the cause lies in increased poverty within the group; for pensioners, it was principally their rising share in total population. In total (for all social groups) increased poverty within the groups accounts for 9.2 out of 9.5 percentage points increase in poverty (Table 3). However, population change (including demographic and migrational effects) also contributed to increased poverty. This was almost entirely due to transfer from workers' to pensioners' households, which is in effect a movement from a low-poverty to a high-poverty group. Rising share of pensioners came about not only because of demographic trends but was also due to government decision to

lower the mandatory retirement age by five years in 1983. The decision was motivated by fear of widespread unemployment following the introduction of market-oriented reforms in 1982 and 1983.

The first two conclusions about the changes in poverty are:

(1) The most important direct cause of greater overall poverty in the second half of the 1980's is increasing poverty among workers households.

(2) The second most important cause is of a predominantly migrational or demographic character. Some of workers' households experienced, due to retirement, a decline in their income and joined the ranks of the poor.

These two effects (shown in bold in Table 3) account for the entire change in poverty. All the other effects cancel out.

Among rural households the crisis did not have such dramatic effects. Poverty among farmers increased by about 2.5 percentage points (from 15.5 to 18 percent). Mixed households represent an exception to generalized increase in poverty. They are the only group whose poverty coefficient in 1987-88 is (slightly) lower than before the crisis. From 1982 they display the lowest poverty incidence of all groups. At about the same time their average per capita income begins to equal or to exceed that of workers' households.[7] This leads to the third conclusion:

(3) The only group that experienced decrease in the incidence of poverty were mixed households.

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[7] From the early 1980's both farmers and mixed households' average per capita incomes are higher than workers'. However, higher degree of inequality, particularly among farmers, is responsible for the fact that these higher average incomes are not translated into equivalently lower poverty coefficients.

3. Some Poverty Accounting

Table 4 shows total number of the poor in the period 1978-88. It is obtained by applying calculated poverty coefficients to the estimated rural and urban population.

Table 4. Total Number of the Poor a/
(in 000 of people)

	Workers	Mixed	Farmers	Pensioners	Urban	Rural	Total
1978	1154	793	967	472	1627	1760	3386
1979	1094	1025	1151	441	1536	2177	3712
1980	1396	830	1188	687	2083	2018	4101
1981	2055	887	1147	893	2948	2034	4982
1982	3108	1121	1597	1244	4351	2718	7069
1983	3400	1106	1931	1990	5390	3037	8427
1984	3385	1050	1675	1697	5082	2725	7807
1985	3072	914	1322	1483	4555	2236	6792
1986	3042	790	1240	1204	4246	2030	6277
1987	4491	1041	1401	1388	5879	2441	8321
1988	2654	663	921	1358	4012	1584	5596
1978-79	1124	909	1059	466	1582	1968	3549
1987-88	3572	852	1161	1373	4945	2012	6958
Change	+2448	- 57	+ 102	+ 907	+3363	+ 44	+3409
Relative contribution to total increase (%)							
	71.8	-1.7	3.0	26.6	98.7	1.3	100

a/ The number of the poor in workers' households calculated as follows: percentage share of workers' households in total urban households (from the *Surveys*) times total urban population (from the demographic macro data) times poverty coefficient for workers' household. The same procedure is used for other social groups.

Total estimated number of people living below the poverty line rose from about 3.5 million before the crisis to 7 million in 1987-88. The increase is entirely concentrated in urban areas. Almost 2.5 million of the new poor belong to workers' households and about 0.9 million are pensioners (Table 4). The average poverty incidence in urban households went up from 7.8 percent to 21.5 percent. The position of rural households did not worsen: total number of the poor in mixed households slightly decreased, while among farmers it increased by only 100,000. Poverty

coefficient for the rural population as a whole remained practically constant: 13.3 percent in 1978-9 and 13.7 percent in 1987-8.

Different evolution of poverty among urban and rural households completely altered the picture of poverty. While before the crisis total number of the rural poor exceeded the number of the urban poor, the ratio now stands at approximately 2.5-to-1 in favor of the urban poor. The emergence of significant urban poverty has far-reaching consequences for economic policy (e.g. towards whom should the main thrust of welfare policy be directed? will increased unemployment, due to reorganization of the economy, be easily absorbed? etc), as well as for social stability. A political system can, *ceteris paribus*, cope more easily with rural than with urban poverty. Rural poverty is often "buried" in the countryside, while urban poverty is highly visible. Urban citizens are also politically more active and influential among other reasons because they are closer to the centers of power. Poland presently enters the painful process of industrial restructuring and transition to market system, in which urban population is likely to be the most affected. The two starting conditions --large number of the urban poor and a very strong trade union movement[8]-- render this process more difficult.

Particularly important question is how many of the poor are the "new poor", that is people who before the crisis lived above, and are now below the poverty line. We turn to this question next, by trying to estimate their number.

If we divide all the population, and accordingly all the poor, into two groups, agricultural and urban, we can write the number of the poor in the agricultural sector in period 1 (PA_1) as equal to their number in period 0 (PA_0) plus increase of the poor

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[8] It should be mentioned that there is in Poland also a strong farmers lobby. It draws non-negligible portion of its strength from the shared feeling that private agriculture was treated inimically by the authorities until the early 1980's. Farmers lobby has been able to commit all recent governments to the parity policy whose aim is to equalize income of farmers with income of workers in the state sector. The lobby seems to be well-represented across the political spectrum: among "Rural Solidarity" and United Peasant Party (formerly allied with Communists) as well as among some technocrats in the current government.

in agriculture due to population growth (n_{pa}) plus the new poor in agriculture (NPA) minus transfers of the poor from agriculture to urban areas (t_a):[9]

$$PA_1 = PA_0 + n_{pa} + NPA - t_a \quad (1)$$

Similar equation for urban households shows that the number of the poor in urban areas in period 1 (PU_1) is equal to their number in the previous period (PU_o) plus increase of the poor as result of population growth (n_{pu}) plus the new poor in urban areas (NPU) plus people who migrated from the agriculture and are now poor (αT_a), where α = the percentage of transferees who are poor and T_a=total transfers from agriculture to urban areas.

$$PU_1 = PU_o + n_{pu} + NPU + \alpha T_a \quad (2)$$

Using averages for the 1978-79 (the beginning of the period, t=0) and 1987-88 (t=1) we can write equations (1) and (2):[10]

$$2013 = 1969 + 160 + NPA - 0.15\ T_a = 1969 + 160 + NPA - $$
$$- 0.15\ (1347) \quad (1a)$$

and

$$4946 = 1582 + 129 + NPU + 0.22\ T_a = 1582 + 129 + NPU +$$
$$+ 0.215\ (1347) \quad (2a)$$

where 1347 = estimated total transfers from rural areas, and n_{pa} and n_{pu} are calculated assuming that the population growth rate among the poor is the same as the overall rate.[11]

We further assume that transfers are not exactly uniform across income groups, but rather biased toward low income agricultural households. Consequently, the share of the poor in agricultural transfers (15 percent; see equation (1a)) somewhat exceeds their share in agricultural population in the beginning

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9 For a more complete explanation of the methodology see Annex 2.

10 All data in thousands.

11 Total transfers are estimated as the difference between what the rural population would be at the end of the period (with a population growth rate of 0.79 percent p.a.) and its actual size. Increase in the number of the poor due to population growth is calculated by applying to the overall population growth in rural and urban areas the initial poverty coefficients. In a more detailed study, if population growth is inversely related to income, this calculation could be corrected.

of the period (13 percent). The percentage of transferees who are poor in cities is assumed to be the same as the average level of poverty in urban areas at the end of the period (21.5 percent).

From the two equations we obtain NPA = 86 and NPU = 2945. This means that there are only 86,000 new poor in rural areas, and almost 3 million new poor in the urban areas. Total increase in the number of the urban poor is composed of 3 million new urban poor, 290,000 rural migrants, and 129,000 people who were born in the already poor households.[12] *It is significant that more than **3.1 million out of the total number of 7 million of the poor are** the new poor*[13], *i.e. people who before the crisis lived above the poverty level, and have now fallen below it.*

4. Factors behind Changes in Poverty Coefficients

One of objectives of a study of poverty is also to link observed changes in incidence of poverty to macroeconomic variables. This is important because regularities of this kind, if established and found sufficiently robust, allow us to make conclusions about the impact of various macroeconomic measures on poverty. To take an extreme example, suppose that we are interested in assessing the impact on poverty of a reduction in real wages. That impact will vary in function of the importance of wages in total income of a social (or income) group, inequality of the wage distribution, participation rates etc. The importance of the impact may thus fluctuate between fairly minimal and substantial. Policy implications of one or another conclusion are quite different. In this section we shall try to relate changes in poverty coefficients of urban and rural population to

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12 In rural areas the accounting is as follows: there are 86,000 new poor plus 160,000 born in already poor families = 246,000. Out of these, 202,000 (15 percent times 1,347,000) migrated to cities, which yields a net increase of 44,000.

13 This figure is composed of: 2.945 million new poor in cities + 86,000 new poor in rural areas + (290-202) thousand new poor due to migration from rural to urban areas = 3.119 million.

macroeconomic variables.[14] The most natural candidates are: (1) average real income of a group, and (2) the within-the-group Gini coefficient as an indicator of the pattern of distribution. We can expect that the first variable be negatively, and the second, positively, related to poverty.

The results are displayed in Table 5.[15] A one percent uniform reduction in real income of urban and rural households is associated with respectively 1 and 1.6 percent increase in the incidence of poverty (income elasticities of 1 and 1.6). This means that relatively more people are bunched around the poverty line in the case of rural population. The distribution term is statistically significant only in the equation for rural households.

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[14] In order to increase the number of observations the data set for urban population is composed of 11 annual observations for workers and 11 annual observations for pensioners' households. The same applies to rural population which is composed of farmers' and mixed households.

[15] For income we are using real wages in the socialized sector or real pensions (annual averages) rather than average real income of workers' (pensioners') households as given in *Household Surveys*. Correlation coefficient between the two is very high: 0.95. The first type of data (average wage or pension) is a macro variable available with less than a month delay; the second is available only with 1.5 to 2 years delay. For policy forecasts it is therefore easier to use average wage or pension.

Table 5. Determinants of Poverty

Dependent variable: log percentage of the poor

period	*constant term*	*income term*	*distrib. term*	$\bar{R}^2$ *(F)*	*DW (SE)*
Urban households					
1978-88	10.607**	-1.009**	0.127	0.864	1.74
	(0.000)	(0.000)	(0.791)	(43.21)	(0.189)
Rural households					
1978-88	8.402**	-1.609**	2.009**	0.833	1.61
	(0.001)	(0.000)	(0.000)	(53.33)	(0.136)

Notes: Equations are of the log form: log (POOR) = Bo + B1 log (income) + B2 log (distribution). Autoregression coefficient is statistically significant at less than 1 percent in the first equation; it is not statistically significant in the second. Number of observations is 21 for the first, and 22 for the second equation. Income is in 1978 constant zlotys (wages and pensions for urban households; real per capita household income from *Surveys* for rural households). Distribution term is the Gini coefficient for each social group as calculated from the samples in the *Household Surveys*. Data in brackets below regression coefficients show levels of significance at which the null hypothesis is rejected.

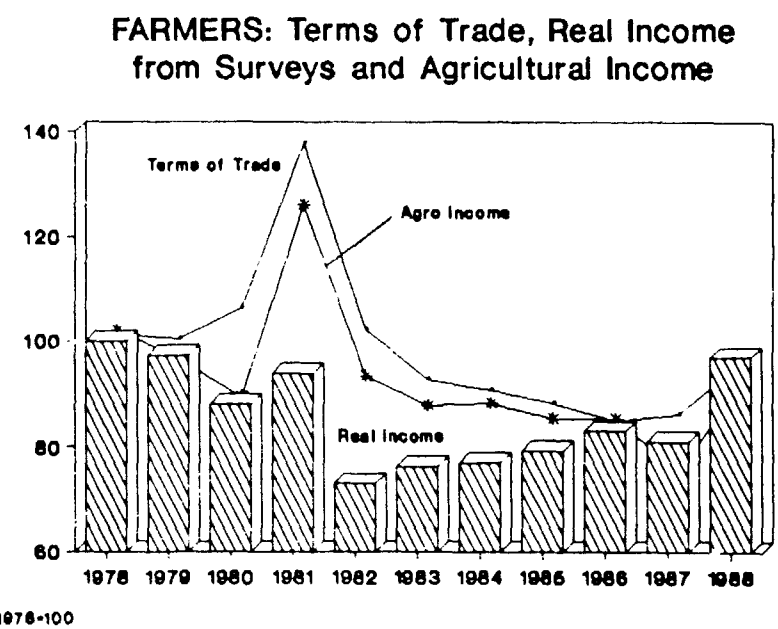
It is important to be able to tell what are the likely effects on poverty of changes in some key macro variables. For urban households this is relatively easy since real wages and real pensions, as shown in previous equations, have an unambiguous and measurable effect on poverty. The situation is different for rural households. Only the use of real per capita income of farmers' and mixed households (obtained from *Surveys*) yields meaningful results. Agricultural terms of trade (TOT) and real revenues of agricultural households (AGROR, compiled by the Central Statistical Office) are only very loosely related to the income data from the *Surveys* (YFARMR) and thus to poverty incidence among farmers, POORF (see Table 6). It means that TOT and AGROR are bad predictors of farmers' income. Unfortunately, the *Survey* data on farmers' income are available only at annual intervals, and cannot be used for short-term policy forecasts.

Table 6. Correlation Coefficients, 1978-88

	TOT	AGROR	YFARMR
TOT	-		
AGROR	0.929	-	
YFARMR	0.430	0.525	-
POORF	-0.391	-0.418	-0.806

This opens up a following problem. While for workers' and pensioners' households there was no inconsistency between macro (wages and pensions) data and *Survey* data, inconsistency is quite visible in the case of farmers' households. *Survey* data show that incomes of farmers did not decline as much as AGROR or TOT imply (18 versus 26 percent, both compared to 1978). Moreover, after 1983, *Surveys* point to a steady increase in farmers' per capita real incomes, while AGROR and TOT data show stagnation or mild decline (see Figure 2). If *Survey* data are more reliable, the divergence can be explained by an increase in revenues from non-conventional sources (including the "second economy") which are not captured by macro data. It is also possible that farmers, being (unlike workers) private entrepreneurs, have succeeded to avoid as sharp a decline in their incomes, as suggested by the terms of trade, by displaying greater flexibility in their production decisions.

Figure 2



5. Conclusions.

The economic crisis that started in Poland in 1978 brought about a significant reduction of average incomes of the population (about 20 percent by 1988), and an increase in the percentage of people living below the poverty line (by about 10 percentage points). The composition of the poor also changed: while before the crisis most of them lived in rural areas, majority of the poor (70 percent) are now city-dwellers. The change in composition was due to a severe increase in poverty among socialized sector workers whose real wages declined. Until the end of the period under study (1988) no unemployment appeared. The wage bill was reduced by uniform cuts in real wages with the result that the wage as well the overall income distribution remained practically unchanged. Real income of pensioners' households decreased almost as much as that of workers. On the other hand, farmers' and mixed households weathered the crisis much better than the other two groups. The explanation behind their relatively good performance seems to lie in a greater flexibility that these households had when undertaking economic decisions (farmers could change crop composition while mixed households could, in addition, vary their labor inputs between the work in socialized industry and private agriculture) rather than in better terms of trade between agriculture and industry,

Annex 1. The Definition of the Social Minimum (Poverty Line)

For the poverty line we use data on the "social minimum" calculated by the Institute of Labor and Social Affairs attached to the Polish Ministry of Labor and Social Policy. The social minimum is calculated several times per year (generally, quarterly) and for the year as a whole. We use the average annual value since data on household incomes also refer to the year as a whole. Social minimum was calculated for the first time in Poland in 1980. The change in methodology in 1983 renders only the data for the period 1983-88 mutually comparable. The social minima calculated for 1980 and 1981 are, in real terms, somewhat higher than those calculated after the change. In order to keep an absolute standard of measurement, we have extended back to 1978 the real value of the social minimum in 1982 (see Figure A1 below).

The social minimum is calculated for for workers' and pensioners' households.[16] For farmers, social minimum was calculated only once, in 1982. According to the researchers in the Institute and some indirect evidence on price levels, the social minimum for rural (both farmers and mixed) households is 10 to 20 percent below the minimum for workers' households.

The social minimum includes expenditures for seven types of goods and services: food, clothing and footwear, housing, hygiene and protection of health, culture and education, transport, and, finally, an additional 10 percent (of total expenditures for the previous six groupings). The last item is supposed to be used to defray unanticipated expenses. Among different types of expenditures by far the most important is food (between 50 and 55 percent of the total depending on the social group and size of the household). The second most important is housing (about 17-18 percent). This percentage is generally less than in similar minima calculated for Western countries, because of heavily

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[16] It is calculated for one- and four-person workers' households, and for one- and two-person pensioners' households. In the analysis we use the minimum for one-person household (one adult male = one consumption unit) as our standard.

subsidized rents and energy prices in Poland (at least in the period covered by our analysis).

The minimum also assumes that the household lives in a municipal apartment where rents are most heavily subsidized (in 1987, subsidy on rent and maintenance amounted to about 80 percent of operating costs[17]). Although only a quarter of all households in Poland (a third in urban areas) live in such apartments, it is not evident that, for the purposes of the social minimum, the use of this assumption entails a significant under-estimate of the actual housing costs. First, because tenants in cooperative apartments (about one-fifth of all apartments in cities) receive a subsidy which is not much less than that received by households living in municipal apartments. The subsidy takes the form of soft loans or direct covering of maintenance expenditures. Second, if privately-owned apartments (about 40 percent of the total housing stock in cities) are entirely paid up and owned, they do not involve any monetary costs in addition to maintenance. If apartments are not yet paid up, low interest rates charged on loans render again housing expenditures less than they would be in a market environment. The only category of households for whom the assumption used in the construction of the minimum represents a gross underestimate of expenditures are households that rent apartments from private owners at market rates. A micro analysis of poverty would be needed to determine how many of these households are poor.

The social minimum differs from the "existential minimum". The social minimum is a more subjective measure since it includes needs which are considered indispensable at a certain level of development but cannot be shown to be necessary for physical survival. The social minimum incorporates, as its name indicates, a certain "social" consensus about the minimum needs that vary between different societies or, for the same society, between different points in time. For a relatively short period, it is probably acceptable to keep the social minimum fixed in real terms. This is moreover so since the standard of living in Poland was stagnant in the 1980's, and there was little need to revise

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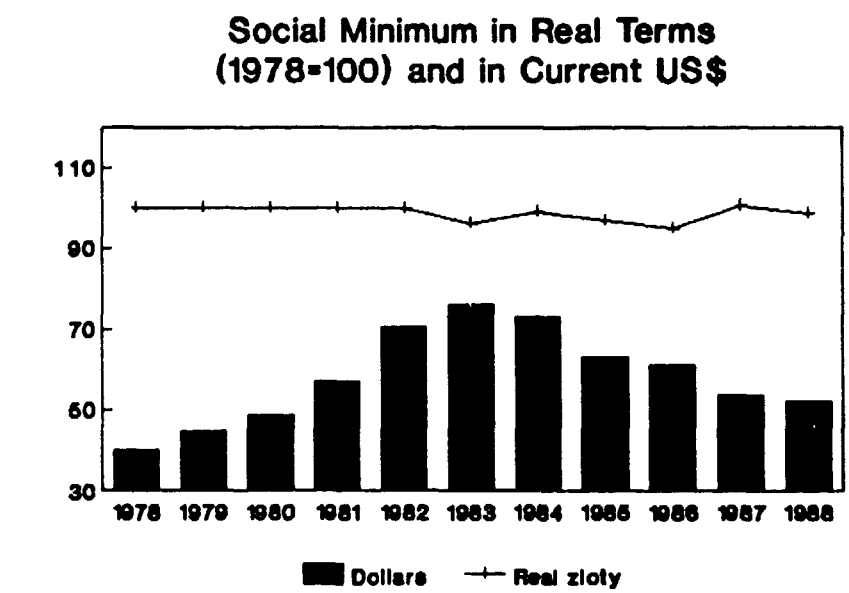
17 See *Poland: Subsidies and Income Distribution*, The World Bank report, November 14, 1989, p. 30.

the socially acceptable minimum.

Some evidence on the relationship between the social and existential minimum in Poland is provided by comparing the figures supplied by the Institute for Social Affairs with the survival minimum calculated by the "Solidarity" experts. In 1984 and 1985, some researchers from (the then illegal) "Solidarity" conducted calculations on the biological (existential) minimum. This minimum was obtained from the observations of expenditures of 26 poor urban families. The cost of the basket of goods needed for the biological survival was 30 to 35 percent less than the social minimum.

Figure A1 shows the evolution of the social minimum in current US dollars and in real zloty amounts (1978 prices). By construction, real social minimum is constant in the period

Figure A1



1978-82.[18]

In calculations of poverty incidence, a necessary complement to the poverty line are income statistics. We are using Polish yearly *Income and Expenditure Surveys* conducted by the Central Statistical Office (GUS). *Surveys* cover, depending on the year, between 9,000 and 30,000 households. They are widely used both in Poland and abroad, and are reliable. All households in the *Surveys* are divided into four social groups: workers, farmers, mixed (worker-farmer households) and pensioners.[19] The first and the last group are urban households; farmers and mixed households are rural households. Households in each social group are broken down according to the household size: from 1 to 6 persons for workers, farmers and mixed, and from 1 to 3 persons for pensioners. Finally, all households are grouped into 7 or 8 (depending on the year) income groups defined according to per capita household income. For each "cell", i.e. at the intersection of each social group, income group, and household

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[18] The reported rate of retail price increase (RPI) for 1980 and 1981 was raised by respectively 10 and 15 percentage points in order to account for widespread shortages of goods in presence of price controls. Actual prices at which transactions took place were often much higher than the official prices. Intensity of shortages is reflected in the discrepancy between the price increase of agricultural products sold on the free market and the RPI. In the period 1976-80, the difference between rates of growth of the two indexes was about 5 percent (in favor of free agricultural prices). In 1980 and 1981, however, the official RPI increased by respectively 9.4 and 21.2 percent, while free agricultural prices rose by 32.3 and 56.4 percent. By adjusting RPI by respectively 10 and 15 points, we implicitly assume that purchases at higher (free market) prices accounted for about 40 percent of total purchases. As if to underline the abnormal situation in 1981-82, for the next five years free market agricultural prices increased, on average, slower than the RPI.

[19] Mixed households are those where at least one member is employed in agriculture while others work outside of agriculture. Definitions of other households are self-evident. When there are both pensioners and workers in a household, the household is classified in one or other group according to the dominant source of income. Not included in the *Surveys* are those employed in the private sector outside agriculture, the military and the police. *Surveys* thus cover approximately 90 percent of all households.

size, we have information on the average number of adult equivalent consumption units.[20] For example, the lowest income group among workers' households with three members would have, on average, 2.2 consumption units. This allows us to consider as poor only those households whose income *per consumption unit* falls short of the social minimum (similarly defined for one consumption unit).[21]

If the social minimum falls between lower and upper income bound of an individual group, households in that group are proportionally allocated among the poor and non-poor households. For example, if lower and upper income bounds (per consumer unit) are 100 and 200, and the social minimum is 150, one-half of households in that group will be considered poor and one-half non-poor. We implicitly assume uniform distribution of households within each income group.

For each year we thus obtain 21 individual poverty coefficients: 3 for pensioners and 6 for each of the other three groups. These 21 coefficients represent the "building blocks" from which composite poverty coefficients for each social group and the country as a whole are computed.

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[20] The weighting scheme is as follows: adult male (18 years of age or more) = 1; male between 14 and 17 years of age = 0.85; adult female = 0.85; female between 14 and 17 years = 0.75; for children, weights are as follows: between 12 and 13 years of age = 0.7; between 8 and 11 = 0.6; between 3 and 7 years = 0.5; 2 years = 0.40; 1 year = 0.3; less than 1 year = 0.25.

[21] Strictly speaking, this is only approximately correct. We treat each "cell" which contains different households as practically a single household. Problems may arise in the following case. Distributions given in *Surveys* rank all households according to their per capita income. Rankings of individual households according to income per consumer unit would be different. It may happen that a household belongs to an income group which as a group (based on its average income per consumer unit), is classified as poor, while that particular household, if it were ranked according to *its own* income per consumer unit, would be non-poor. This is a problem common to all studies that use grouped, instead of individual, income data.

Annex 2. Transfers and Poverty: Some Poverty Accounting

Let all the population be divided into two groups: agricultural (A) and urban (U). If we then denote the poor in the agricultural sector in period 1 by PA_1; increase in the number of the poor in agriculture as result of population growth (people born in families that are already poor) by n_{pa}; transfers of the poor between agriculture and urban areas by t_a; total transfers from agriculture to cities by T_a; and finally, the number of the new poor (people who before were non-poor and are now poor) in agriculture by NPA, we can write the following identity, where a_1 is the poverty coefficient in agriculture:

$$a_1 = \frac{PA_1}{A_1} = \frac{PA_o + n_{pa} + NPA - t_a}{A_0 + n_a - T_a} \qquad (1)$$

In equation (1), the numerator shows that the total number of the poor in agriculture in period 1 is equal to their number in period 0 plus increase of the poor due to population growth and decline in income minus transfers of the poor from agriculture to urban areas. The denominator shows the same relationship for the overall agricultural population (A_1=total agricultural population in period 1 and n_a=population growth rate in agriculture. Similarly, for the urban households we have relation (2):

$$u_1 = \frac{PU_1}{U_1} = \frac{PU_0 + n_{pu} + NPU + \alpha T_a}{Uo + n_u + T_a} \qquad (2)$$

In equation (2), total number of the poor in urban areas (in the numerator) is equal to their total number in the previous period (PU_0) plus increase of the poor due to population growth (n_{pu}) and due to the decline in income ("the new poor", NPU) plus those who transferred from agriculture and are now (or remained) poor. The coefficient α denotes the percentage of transferees who are poor. The denominator of (2) simply shows that total urban population in period 1 is equal to the population in period 0 plus natural growth of urban population (n_u) plus transfers from

agriculture.

We would normally know the following variables: PA_1, PA_0, A_1, A_0, n_a, PU_1, PU_0, U_1, U_0, and n_u. T_a can then be calculated. From the assumptions (or information) on population growth as function of income level, we can also get n_{pa} and n_{pu}. The simplest assumption would be to take that population growth among the poor is the same as among the non-poor. We are then left with two equations and four unknowns:

$$PA_1 = PA_0 + n_{pa} + NPA - t_a \qquad (3)$$

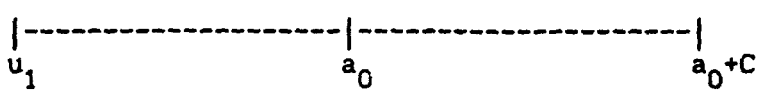
$$PU_1 = PU_0 + n_{pu} + NPU + \alpha T_a \qquad (4)$$

The unknowns are the new poor among agricultural and urban households, poor transferees to the urban sector (t_a), and the percentage of all transferees who are now poor in the urban sector (α). If we assume that the transfers from the agro-sector to the urban are uniform across income groups, the percentage of the poor transferees is equal to their share in total agricultural population, and the equation (3) becomes:

$$PA_1 = PA_o + n_{pa} + NPA - a_o T_a$$

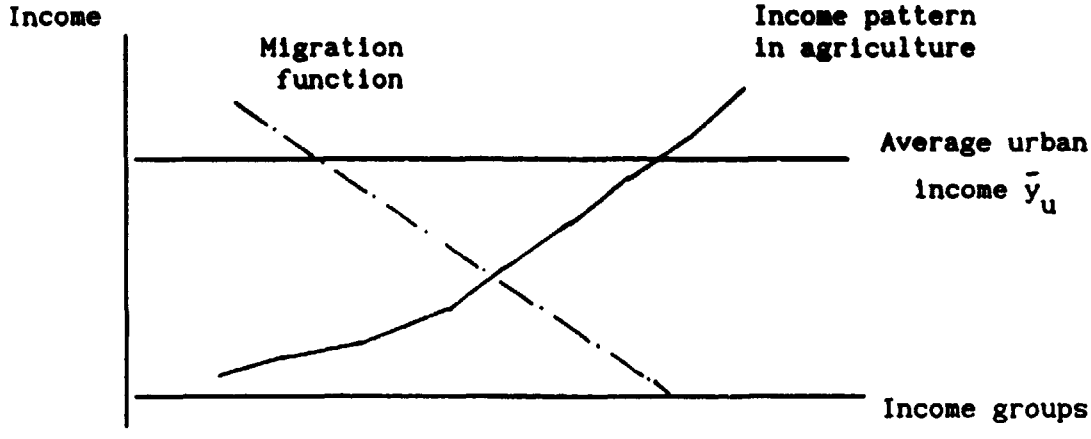
We are now concerned with values taken by coefficient α in equation (4). If transferees do as well as the average person in the urban areas α would be equal to u_1. If they do, on average, as well as they did before the transfer $\alpha=a_0$. Finally, they can even temporarily do worse than in agriculture and then $\alpha=a_0+C$ where C is some (positive) coefficient of adjustment. The shorter the time horizon, the greater C as some people who were not poor in agriculture fall below the poverty level in urban areas, accepting a temporary decline in living standards in expectation of a medium-run improvement (beyond what they would get if they stayed in villages).

The normal range of α is shown below. Then for different values of α we can calculate the new poor among urban population.

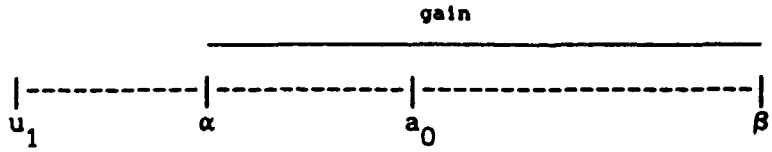


Up to now we have assumed that the transfer function is uniform across income groups. If, more realistically, we assume that it is an increasing function of the difference between the average income in cities (the aspiration income) and the actual income of a household in agriculture, migration from low income agricultural households would be proportionately greater. This is shown in Figure A2.

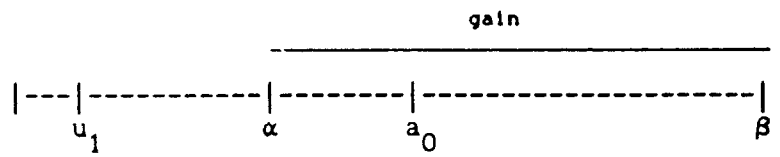
Figure A2
Migration as Function of a Difference in Urban and Agricultural Incomes



The gain (decrease in the number of the poor) due to transfers occurs if β, percentage of the agricultural poor in the total number of transferees (t_a/T_a), is greater than α. β would be greater than a_0 if transfers are not independent of the level of income (but are positively related). α would be greater than u_1 if we assume that transferees do not as well as the average urban household (at least between the two points in time which we consider). The "normal" constellation of the variables would then be as follows:



However, if (as we observe in East European countries) urban incomes decline significantly so that u_1 increases, while the situation in agriculture remains as before, we could have:



The gain is now reduced both because of increase in α and because fewer migrations take place since decline in average urban income reduces the intensity of transfers.

The worst situation could occur if the decline in urban incomes is accompanied by an increased inequality, so that u_1 goes up significantly and becomes greater than a_0. Since migration decisions are, by assumption, based on average urban income (and average urban income is still greater than the average rural income and the income of a significant portion of the rural population) *migration would continue even if the total number of the poor increases.*

The analysis can be formalized:

$$\beta = h\,[G_a] \tag{5}$$

$$T_a = g\,[\bar{y}_u - \bar{y}_a]\,A_0 \tag{6}$$

$$\alpha = f\,[G_u, \bar{y}_u, C] \tag{7}$$

Equation (5) shows that the percentage of the poor among agricultural transferees is a (positive) function of the degree of inequality (the Gini coefficient) in agriculture. Equation (6) shows that total transfers are a (positive) function of the difference between the average urban and rural income. Equation (7) shows that the percentage of transferees that are (or remain) poor in urban areas is a (positive) function of inequality in cities, (negative) function of average urban income, and a (positive) function of C=coefficient of adjustment.

Combining these three equations into one, we can write the Net Decrease in the number of the Poor (NDP) as

$$\begin{aligned} NDP &= (\beta - \alpha)\,T_a = \\ &= \Big(h(G_a) - f(G_u, \bar{y}_u, C) \Big)\,T_a = \\ &= \Big(h(G_a) - f(G_u, \bar{y}_u, C) \Big)\,g[\bar{y}_u - \bar{y}_a]\,A_0. \end{aligned}$$

Whether NDP will be positive or negative will, of course, depend on the sign of $\beta-\alpha$, since we can normally assume that T_a is greater than zero. NDP will be greater the greater G_a and $\bar{y}_u$ and the smaller G_u, C and $\bar{y}_a$. The relationship with respect to $\bar{y}_u$ is particularly strong because a rise in the average urban income increases transfers from agriculture and also reduces the percentage of the people in urban areas who fall below the poverty level. However, if inequality in cities increases simultaneously with the average income, it could happen that the sign of $\beta-\alpha$ turns negative, and in this case higher urban incomes, by stimulating rural exodus, might lead to an *increase* in total number of the poor.[22]

The situation in Poland between 1978 and 1988 was characterized by practical absence of the urban-rural income gap (which stemmed the flow of transfers), generally unchanged inequality in the urban areas, and slightly increasing inequality in rural areas (which might explain that transfers were still positive). While in 1978-79 the average poverty coefficients for rural and urban households were respectively 0.13 and 0.08, there was a reversal in 1987-88 with coefficients equal to 0.14 and 0.22. The difference $\beta-\alpha$ was thus quite possibly negative[23] which meant that transfers could have led to an increase in poverty.

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22 The same is true if the adjustment coefficient, C, increases.

23 Note that for β the relevant poverty coefficient is the one in the beginning of the period, 0.13, and for α one at the end, 0.22.

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